PORT OF PORTLAND
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July 11, 2008

Ms. Jennifer Sutter
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

Subject: Swan Island Upland Facility, Operable Unit 4
No Further Action Determination Request
ECSI No. 271

Dear Ms. Sutter:

The Voluntary Agreement for Remedial Investigation, Source Control Measures, and Feasibility Study (Agreement) between the Port of Portland (Port) and Oregon Department of Environmental Quality (DEQ) for the Swan Island Upland Facility (SIUF) addresses three operable units. One of those operable units is Operable Unit (OU) 2, the 37 acres of uplands owned by the Port along the southwest side of N. Channel Avenue (Figure 1).

The Port has sold the northwest portion of OU2 to Shipyard Commerce, an affiliate of Cascade General, for a future shipyard expansion development project consisting of an industrial materials lay-down yard and rail spur. The subject property generally encompasses the area historically referred to as the main parking lot for the shipyard (Figure 2). As part of the sale, the Port and Shipyard Commerce agreed that the Port would continue to pursue a No Further Action determination in connection with any historical conditions associated with the property, except that after the stormwater management system connected to outfall WR-399 serving the sold property was cleaned out, sampled and analyzed, Cascade General would assume responsibility for completing any further stormwater system evaluation and stormwater remedial action under a June 27, 2008 amendment to its May 8, 2006 stormwater letter agreement with DEQ.

To facilitate the completion of any evaluation of historical conditions associated with the sold property and the redevelopment of the property, the Port has proposed and DEQ has agreed to create a new operable unit (i.e., Operable Unit 4) consisting of the property sold to Shipyard Commerce..

Operable Unit 4 Description

Operable Unit 4 (OU4) is a 7.83-acre parcel of property located southwest of N. Channel Avenue on Swan Island. It is bounded to the northeast by N. Channel Avenue, to the northwest by OU1, and to the southwest and southeast by OU2 (Figure 1). The parcel of property is relatively level and entirely paved with asphalt-concrete. There are currently no structures or buildings on OU4.

According to recent research and site reconnaissance performed by Ash Creek Associates, Inc. (ACA) on behalf of the Port, the main parking lot drains to a series of inlets that discharge

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through an 18-inch corrugated metal pipe to the Willamette River (ACA, 2008; Figure 2). The storm water outfall is designated as WR-399 by the City of Portland. This is the only known, active storm water outfall that is associated with OU4. As is discussed in ACA (2008), flow and dye testing was performed on the main parking lot drainage system. The testing results confirmed that eight inlets drain to the main storm line connected to outfall WR-399. The testing results also determined that an inlet/catch basin (type of feature not field verified), located near the northwest boundary of OU4 does not drain to WR-399; the point of discharge for this feature was not definitively determined but is believed to discharge from property currently comprising Cascade General's site that is being addressed by Cascade General under its May 8, 2006 stormwater letter agreement with DEQ.

ACA (2008) discusses an inactive outfall to the southwest of OU4 designated as CG-26. It is an 18-inch corrugated metal pipe located approximately 100 feet upstream from outfall WR-399. Outfall CG-26 is not currently connected to any structures on OU4, its former purpose is unknown, and any remaining issues associated with it are being handled by the Port as part of OU2 of the SIUF.

Operable Unit 4 Development and Operations History

The Remedial Investigation Work Plan (Bridgewater, 2000) and Supplemental Preliminary Assessment (Supplemental PA; ACA, 2006) for the SIUF discuss the development and operations history for the SIUF, including the area where OU4 is located (ACA, 2006). The development and operations history of OU4 was considered in 2000 during the scoping and implementation of the remedial investigation (RI), specifically in the identification of known and suspected sources and identification of data gaps.

Prior to the early 1920s, OU4 was undeveloped and was part of Swan Island. At that time, Swan Island was actually an island and the main channel of the Willamette River flowed along the east side of the island. In 1922 the Port purchased Swan Island and in 1923 initiated a project to facilitate river navigation by relocating the main channel to the west side of the island, by, in part, excavating a strip of the island so as to widen and deepen the channel. During the mid to late 1920s, the elevation of Swan Island was raised using fill material dredged from the Willamette River during the channel relocation. In 1927, a causeway was constructed to connect the upstream end of Swan Island to the east shoreline of the Willamette River, making a peninsula out of the island thus creating the Swan Island Lagoon.

In 1926, the Port began construction of the municipal airport on Swan Island. Airport construction was completed in 1931. The airport continued operating until 1941. As is illustrated in Figure 8 of the Supplemental PA (ACA, 2006), the only airport facilities located on OU4 were portions of a "paver takeoff runway" and a cinder runway.

In 1942, the United States Maritime Commission entered into an agreement with the Port to lease approximately 250 acres of Swan Island, including OU4. The United States had the island developed into a ship building facility. As Figures 9 and 10 in the Supplemental PA illustrate, all or part of four buildings were located on OU4, including the mold loft (Building #3), oxygen house (Building #5), machine shop (Building #9) and boiler erection building (Building #21). The mold loft was a 45,500 square foot, two-story building with rail service and loading dock that was used as a template layout area for shaping steel. The oxygen house was a small structure where oxygen was stored. The machine shop was a 37,000 square foot, one-story

structure with a concrete floor and spur track where tools and parts were machined. The boiler erection building was a two-story structure where vessel boilers were constructed. Most of the mold loft and machine shop were located on adjacent parcels of property to the north of OU4.

A potential area of concern for the portion of OU2 that is now within OU4 identified in the Supplemental PA was a former electrical substation (Substation R; Figure 3). A second former substation (Substation A) was located immediately adjacent to the boundary of OU4. Substation A contained 1 oil-immersed self-cooled transformer (OISC), 6 oil-filled circuit breakers, and 5 potheads; Substation A was removed in 1968. Substation R contained 1 OISC and 1 pothead; Substation R was removed in 1961. Recent sampling in these locations is discussed later in this document.

The War Assets Administration (WAA) was established in 1946, was transferred responsibility for the United States' Swan Island shipyard facilities, and became involved in their management. The WAA surrendered its shipyard lease and sold all the facilities to the Port in 1949. The property became the Swan Island Ship Repair Yard, later referred to as the Portland Shipyard (PSY).

Between 1950 and 1978, OU4 was primarily open, graded soil with railroad spurs used for material receiving and storage. The main parking lot was constructed in 1977. It has been used as a parking lot for shipyard workers since 1977. The only additional use was the temporary staging of new trucks and trailers by Daimler AG Trucks (formerly Freightliner LLC) on a portion of the parking lot under a lease from the Port.

OU4 Sampling Results

The area encompassing OU4 was not identified as an area of concern during the scoping of the RI based on: (1) a review of the development and operations history information that was available at the time the work plan was prepared and (2) analytical results for soil samples collected in 1998 as part of the sale of the PSY to Cascade General. The later Supplemental PA determined that a former electrical substation was the only potential area of concern at OU4.

This section summarizes the sampling that has been completed on or adjacent to OU4 including the following:

- 1998 soil sampling completed by the Port as part of the sale of the PSY to Cascade General;
- 2007 soil sampling by the Port as part of the investigation of former SIUF substations;
- 2008 storm water conveyance system cleanout and sampling completed by the Port; and
- 2008 soil and groundwater sampling completed by Shipyard Commerce to support its OU4 property acquisition and redevelopment.

1998 Soil Sampling

In 1998, prior to selling the PSY to Cascade General, the Port collected soil samples at a number of locations throughout the SIUF. Two of those locations (Borings 1 and 7) were on or adjacent to OU4 (Figure 3). Boring 1 was located near the western corner of OU4. Boring 7 was located in the center of OU4.

Samples were collected from two depth intervals at each location: 0 to 2 feet below ground surface (bgs) and just above the water table at 16- to 18-feet bgs. The samples were analyzed for metals (arsenic, cadmium, chromium, lead, mercury, silver, barium and selenium), heavy oil range hydrocarbons using Method 418.1 and polychlorinated biphenyls (PCBs). The laboratory analytical results were reported to DEQ in the 2000 RI/FS Work Plan for the PSY (Bridgewater, 2000).

Cadmium, mercury, silver and selenium were not detected in any of the 0 to 2 feet bgs or 16 to 18 feet bgs samples collected at Borings 1 and 7. Arsenic concentrations ranged from 1.6 to 2.71 mg/kg, below DEQ's default background concentration of 7 mg/kg for soil (DEQ, 2002). Chromium concentrations ranged from 9.44 to 13.6 mg/kg, below DEQ's default concentration of 42 mg/kg. Lead concentrations ranged from not detected to 11.6 mg/kg, below DEQ's default background concentration of 17 mg/kg. Barium concentrations ranged from 76.7 to 158 mg/kg; DEQ (2002) does not provide a default background concentration for barium.

Heavy oil range hydrocarbons were not detected in three of the four soil samples; they were only detected in the 0 to 2 feet bgs sample collected at Boring 7 at a concentration of 146 mg/kg.

No PCBs were detected in any of the soil samples at a detection limit of 50 ug/kg.

2007 Former Substation Sampling

ACA, on behalf of the Port, collected soil samples from two former substation locations (Substations A and R) formerly located on or adjacent to OU4 (ACA, 2007). Four surface soil samples were collected at the corners of a 30- by 30-foot grid at each former substation location. All of the soil samples were analyzed by the total petroleum hydrocarbons (TPH) identification method (NWTPH-HCID) and by EPA Method 8082 for PCBs. No TPH or PCBs were detected in any of the soil samples.

2008 Storm Water Cleanout and Sampling

A cleanout of the storm water conveyance system (on the Freightliner leasehold) was completed followed by a one-time storm water sampling event as part of the sale of OU4 to Shipyard Commerce. The storm water system on the portion of OU4 previously leased by Cascade General was cleaned out in the fall of 2007 by West Coast Marine Cleaning (under subcontract to Cascade General).

The DEQ issued a June 27, 2008 letter amending the Storm Water Agreement between DEQ and Cascade General. Cascade General will now have the responsibility for completing whatever work is necessary to obtain a no further action determination from DEQ regarding the

matter of any source control evaluation and remedial action regarding the storm water system serving OU4 (Outfall WR-399).

A representative composite sample was collected from the dry solids (removed from the storm water inlets) and submitted for chemical analysis. Following the cleanout of the conveyance system, a whole-water grab sample was collected directly from Outfall WR-399 during a representative storm event (on June 3, 2008). The storm event met the Storm Event Criteria and Selection outlined in the Joint Source Control Strategy (JSCS) (DEQ/EPA, 2005).

The solids and storm water sample were analyzed for TPH (as gasoline, diesel, and oil), PCBs, phthalates, polynuclear aromatic hydrocarbons (PAHs), tributyl tin (TBT), and metals (including aluminum, antimony, arsenic, cadmium, chromium, copper, lead, mercury, manganese, nickel, selenium, silver, and zinc). The sample results are presented in Tables A-1 through A-10 (Attachment A). The laboratory reports are included in Attachment C (CD-Rom – due to file sizes). Attachment D presents the analytical data in DEQ's "Data Reporting and Screening Table" (CD-Rom).

The analytical data were screened against the screening level values (SLVs) in the JSCS guidance document (DEQ/EPA 2005). The detected concentrations were low in both the solid and storm water samples. A few constituents, however, exceed the very conservative JSCS criteria.

2008 Soil and Groundwater Sampling

As part of pre-acquisition due diligence, URS Corporation completed a subsurface investigation (on behalf of Shipyard Commerce) to assess the potential for environmental impacts to soil and groundwater beneath OU4. A combination of shallow and deep borings were completed in May 2008 (Figure 3 from the URS report and boring logs; Attachment B). Four soil samples were collected from each deep boring (at 5, 50, 75, and 100 feet bgs) and three soil samples were collected from each shallow boring (at 5, soil water interface, and 40 feet bgs). A grab groundwater screening sample was also collected at the maximum depth of each boring using a temporary well screen.

The soil and groundwater samples were analyzed for TPH (as gasoline, diesel, and oil), PCBs, PAHs, TBT, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals (including arsenic, barium, chromium, copper, lead, mercury, nickel, and zinc). The sample results are presented in Tables B-1 and B-2 (Attachment B). The laboratory reports are included in Attachment C.

The analytical data were screened against the following criteria.

- The SLVs in the JSCS guidance document (DEQ/EPA, 2005).
- DEQ Risk-Based Concentrations (RBCs) from the Risk-Based Decision Making for Remediation of Petroleum-Contaminated Sites guidance (DEQ, 2003) for the excavation worker, construction worker, and occupational scenarios.

Metals also occur naturally in soil; therefore, metals data on soil samples were also compared to typical background concentrations (DEQ, 2002).

Benzo(a)pyrene exceeds the construction worker exposure scenario for one sample (GP-06) collected between 5 and 10 feet bgs. The 90%UCL on the mean was calculated using EPA's ProUCL software and the recommended approach with the accompanying user manual. The output for samples collected between the surface and 20 feet bgs indicated that the exposure point concentration (EPC) was below the construction worker RBC.

A few constituents (PAHs and metals) exceed the screening levels in grab groundwater, but the concentrations are consistent with the analytical results (i.e., within the historical range of values) for groundwater samples from the monitoring wells at the SIUF. The only exceptions were chrome, copper, nickel, and zinc in the deep groundwater sample from GP-06. The grab groundwater samples were not filtered and the resulting concentrations in GP-06 suggest the presence of soil entrained in the sample.

No Further Action Request

Given the extensive site history information and the sampling results for OU4, the Port requests that DEQ issue a No Further Action determination for the soil and groundwater of OU4. The Port understands that any such NFA will not necessarily include a decision on the stormwater system serving the property and that any further evaluation thereof will be conducted by Cascade General under the June 27, 2008 letter amendment to Cascade's May 8, 2006 stormwater letter agreement with DEQ..

The Port recommends that an NFA determination be issued for OU4 soil and groundwater based on the following information summarized in this letter.

- The only potential area of concern identified for OU4 was a former electrical substation (Substation R). A thorough investigation of this area was completed and no TPH or PCBs were detected in any of the soil samples.

- Sampling was completed for a second former substation (Substation A) located immediately adjacent to the boundary to OU4. No TPH or PCBs were detected in any of the soil samples.

- Additional sampling was completed in connection with the property's sale and industrial redevelopment. The results indicate that the reported concentrations are acceptable for the applicable exposure pathways.

If you have any questions regarding these activities, please contact the undersigned at (503) 944-7323.

Sincerely,

Nicole LaFranchise
Environmental Project Manager

Figures: Figure 1 – Site Vicinity Plan
Figure 2 – Operable Unit 4
Figure 3 – Historical Sample Locations

Attachments: Attachment A – Port Storm Water System Cleanout Data Tables
Attachment B – Cascade General Site Investigation Data Tables
Attachment C – Laboratory Analytical Reports (CD-Rom)
Attachment D – DEQ Data Reporting and Screening Tables (CD-Rom)
Attachment E – Cascade DEQ June 27, 2008 Letter Amendment

References:

ACA, 2006. Supplemental Preliminary Assessment, Swan Island Upland Facility, prepared for the Port of Portland, December 2006.

ACA, 2007. Letter from M. Pickering/ACA and A. Spencer/ACA to N. LaFranchise/Port of Portland regarding former substation sampling results, dated July 24, 2007.

ACA, 2008. Technical memorandum from M. Pickering/ACA to N. LaFranchise/Port of Portland regarding outfalls, Swan Island Upland Facility – Operable Unit 2, dated February 13, 2008.

Bridgewater Group, 2000. Remedial Investigation/Feasibility Study Work Plan for the Portland Shipyard, prepared for the Port of Portland, November 2, 2000.

DEQ, 2002. Memo: The DEQ Toxicology Workgroup, Default Regional Background Concentrations for Metals. October 28, 2002.

DEQ, 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites (RBC Spreadsheet updated July 4, 2007). September 22, 2003.

DEQ/EPA, 2005. Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.

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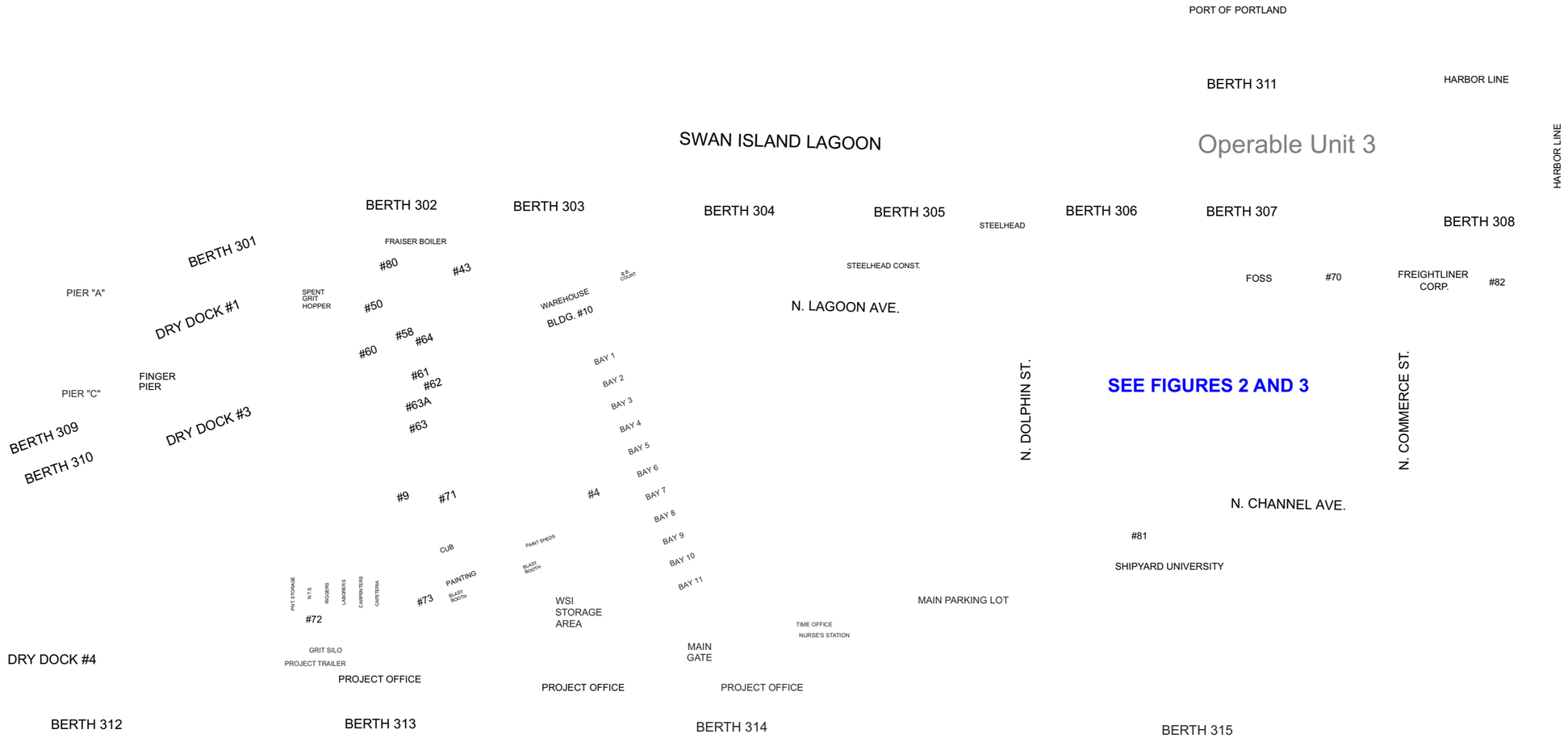
LWP File



Legend:

Operable Unit 1 Boundary

Operable Unit 2 Boundary

Operable Unit 3 Boundary

Operable Unit 4 Boundary

Substation 4 Portland Shipyard Substation Location

0 400 800

Scale in Feet

Site Vicinity Plan

Swan Island Upland Facility
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number 1115-11

July 2008

Figure 1

Legend:

WR-399 Outfall Location and Designation

Catch Basin Location

Inlet Location

Manhole Location

Drain Location

STS Location and Flow Direction (Port of Portland)

Operable Unit 4

Swan Island Upland Facility
Portland, Oregon

0 100 200

Scale in Feet

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number 1115-11

July 2008

Figure 2

Legend:

Boring 1 Soil Boring Location (1998)

SUB A Kaiser Shipyard Substation Location - 1942 Plan (Locations Approximate) - Soil samples collected at North, South, East, and West corners

0 100 200

Scale in Feet

Historical Sample Locations

Swan Island Upland Facility
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number 1115-11

July 2008

Figure 3

Attachment A

Port Storm Water System Cleanout Data Tables

Table A-1
Sediment Analytical Results: Metals
Swan Island Upland Facility - OU4
Portland, Oregon

Sample	Date Sampled	Aluminum	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
		Concentration in mg/kg (ppm)												
Composite-050708	5/7/2008	9,780	1.68	15.6	0.752	27.5	207	87.4	424	0.035	23.3	0.5 B	0.436	550
MacDonald PECs and other SQVs		--	64	33	4.98	111	149	128	1,100	1.06	48.6	5	5	459
DEQ 2007 Bioaccumulative Sediment SLVs		--	--	7	1	--	--	17	--	0.07	--	2	--	--

Notes:
1. Metals analysis by EPA 6000/7000 Series Methods.
2. mg/kg (ppm) = milligrams per kilogram (parts per million)
3. Shading indicates that the reported concentration exceeds MacDonald PECs and other SQVs and/or DEQ 2007 Bioaccumulative Sediment SLV
4. -- = Not available.
5. B = The analyte was found in the associated method blank at a level that is significant relative to the sample resul

Table A-2
Sediment Analytical Results: Total Petroleum Hydrocarbons
Swan Island Upland Facility - OU4
Portland, Oregon

Sample	Date Sampled	Gasoline-Range mg/kg (ppm)	Diesel-Range mg/kg (ppm)	Oil-Range mg/kg (ppm)
Composite-050708	5/7/2008	2.5 J	72	600

Notes:

1. Total petroleum hydrocarbons (TPH) as diesel and oil by Northwest Method NWTPH-Dx (with silica gel cleanup)
2. TPH as gasoline by Northwest Method NWTPH-Gx.
3. mg/kg (ppm) = milligrams per kilogram (parts per million)
4. J = The results is an estimated concentrationthat is less than the MRL (method reporting limit) but greater than or equal to the MRL/MDL (method detection limit
5. H = The chromagraphic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount o a heavier molecular weight constituents than the calibration standard
6. O = The chromagraphic fingerprint of the sample resembles an oil, but does not match the calibration standard

Table A-3
Sediment Analytical Results: Phthalates and TBT
Swan Island Upland Facility - OU4
Portland, Oregon

Sample	Date Sampled	Di-n-octyl Phthalate	Dimethyl Phthalate	Diethyl Phthalate	Di-n-butyl Phthalate	Benzyl Butyl Phthalate	Bis(2-ethylhexyl) Phthalate	TBT
		Concentrations in µg/kg (ppb)						
Composite-050708	5/7/2008	<97	<97	<97	<200	340	<970	390
MacDonald PECs and other SQVs		--	--	600	100	--	800	--
DEQ 2007 Bioaccumulative Sediment SLVs		--	--	--	60	--	330	2.3

Notes:
1. Phthalates by EPA Method 8270-SIM.
2. µg/kg (ppb) = micrograms per kilogram (part per billion)
3. Shading indicates that the MRL exceeds MacDonald PECs and other SQVs and/or DEQ 2007 Bioaccumulative Sediment SLVs
4. -- = Not available.
5. < = Not detected above the method reporting limit (MRL)
6. TBT = Tributyltin by the Krones Method.

Table A-4
Sediment Analytical Results: Polychlorinated Biphenyl Aroclors
Swan Island Upland Facility - OU4
Portland, Oregon

Sample	Date Sampled	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total PCBs
		Concentrations in µg/kg (ppb)									
Composite-050708	5/7/2008	<10	<20	<10	<10	<10	21	20	<10	<10	41
MacDonald PECs and other SQVs		530	--	--	--	1,500	300	200	--	--	676
DEQ 2001 Bioaccumulative Sediment SLVs		--	--	--	--	--	--	--	--	--	0.39

Notes:
1. PCB Aroclors by EPA Method 8082
2. µg/kg (ppb) = micrograms per kilogram (part per billion)
3. Shading indicates that the reported concentration exceeds MacDonald PECs and other SQVs and/or DEQ 2007 Bioaccumulative Sediment SLV
4. -- = Not available.
5. Total PCBs is a summation of the detected aroclors.
6. < = Not detected above the method reporting limit (MRL)

Table A-5
Sediment Analytical Results: Polynuclear Aromatic Hydrocarbons
Swan Island Upland Facility - OU4
Portland, Oregon

Sample	Date Sampled	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Dibenzofuran	Phenanthrene	Anthracene	Fluoranthene
		Concentrations in µg/kg (ppb)								
Composite-050708	5/7/2008	8	11	2.3 J	4.1 J	3.4 J	3.7 J	51	7	90
MacDonald PECs and other SQVs		561	200	200	300	536	--	1,170	845	2,230
DEQ 2007 Bioaccumulative Sediment SLVs		--	--	--	--	--	--	--	--	37,000

Sample	Date Sampled	Pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benz(a)anthracene	Chrysene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
		Concentrations in µg/kg (ppb)								
Composite-050708	5/7/2008	100	74	20	35	70	41	46	9.9	61
MacDonald PECs and other SQVs		1,520	--	13,000	1,050	1,290	1,450	100	1,300	300
DEQ 2007 Bioaccumulative Sediment SLVs		1,900	--	--	--	--	--	--	--	--

Notes:
1. Polynuclear Aromatic Hydrocarbons by EPA Method 8270 C SIM
2. µg/kg (ppb) = micrograms per kilogram (part per billion)
3. -- = Not available.
4. < = Not detected above the method reporting limit (MRL)
5. J = The results is an estimated concentrationthat is less than the MRL but greater than or equal to the MRL/MDL (method detection limit)

Table A-6
Storm Water Analytical Results: Total Metals
Swan Island Upland Facility - OU4
Portland, Oregon

Monitoring Location	Date Sampled	Aluminum	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
		Concentrations in µg/L (ppb)												
WR-399	6/3/2008	141	0.642	1.42	0.224	0.91	36.1	2.98	76.3	<0.05	2.05	<0.5	0.022	168
Ecological Receptor Screening Level Values		87	1,600 [3]	190 [3], [4]	0.094	11 [5]	2.7	0.54	120 [6]	0.012	16	5	0.12 [3]	36
Portland Harbor specific fish consumption rate		--	64	0.014	--	--	--	--	10	0.0146	460	420	--	2,600

Notes:

1. Metals analysis by EPA 6000/7000 Series Methods.
2. Ecological Receptor Screening Level Values = EPA's 2004 NRWQC (chronic) presented where available, exceptions noted.
3. DEQ's 2007 AWQC (chronic).
4. Value for Arsenic III
5. Screening level for hexavalent chromium.
6. Oak Ridge National Laboratory Tier II Screening Level Value
7. < = Not detected above the method reporting limit (MRL)
8. µg/L (ppb) = micrograms per liter (part per billion)
9. Shading indicates that the reported concentration or MRL exceeds Ecological Receptor SLV and/or fish consumption rate
10. -- = Not available.
11. Portland Harbor specific fish consumption rate screening levels presented where available

Table A-7
Storm Water Analytical Results: Total Petroleum Hydrocarbons
Swan Island Upland Facility - OU4
Portland, Oregon

Monitoring Location	Date Sampled	Gasoline-Range µg/L (ppb)	Diesel-Range µg/L (ppb)	Oil-Range µg/L (ppb)
WR-399	6/3/2008	14 J	22 J	150 J

Notes:
1. Total petroleum hydrocarbons (TPH) as diesel and oil by Northwest Method NWTPH-Dx (with silica gel cleanup)
2. TPH as gasoline by Northwest Method NWTPH-Gx.
3. µg/L (ppm) = micrograms per liter (parts per billion)
4. J = The results is an estimated concentrationthat is less than the MRL (method reporting limit) but greater than or equal to the MRL/MDL (method detection limit

Table A-8
Storm Water Analytical Results: Phthalates and TBT
Swan Island Upland Facility - OU4
Portland, Oregon

Monitoring Location	Date Sampled	Di-n-octyl Phthalate	Dimethyl Phthalate	Diethyl Phthalate	Di-n-butyl Phthalate	Benzyl Butyl Phthalate	Bis(2-ethylhexyl) Phthalate	TBT
		Concentrations in µg/L (ppb)						
WR-399	6/3/2008	<0.2	0.069 J	0.073 J	0.068 J	0.16 J	0.63	<0.05
Ecological Receptor Screening Level Values		3	3	3	3	3	3	0.072
Portland Harbor specific fish consumption rate		--	110,000	4,400	450	190	0.22	--

Notes:
1. Phthalates by EPA Method 525.2
2. µg/L (ppb) = micrograms per liter (part per billion)
3. Ecological Receptor Screening Level Values = DEQ's 2004 AWQC (chronic).
4. Portland Harbor specific fish consumption rate screening levels presented where available
5. < = Not detected above the method reporting limit (MRL)
6. Shading indicates that the reported concentration or MRL exceeds Ecological Receptor SLV and/or fish consumption rate
7. -- = Not available.

Table A-9
Storm Water Analytical Results: Polychlorinated Biphenyl Aroclors
Swan Island Upland Facility - OU4
Portland, Oregon

Monitoring Location	Date Sampled	Total PCBs	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268
			Concentrations in μg/L (ppb)								
WR-399	6/3/2008	Not Detected	<0.020	<0.040	<0.020 i	<0.020 i	<0.020 i	<0.020 i	<0.020 i	<0.020	<0.020
Ecological Receptor Screening Level Values		0.14	--	0.28	0.58	0.053	0.081	0.033	94	--	--
Portland Harbor specific fish consumption rate		0.0000064	--	--	--	--	--	--	--	--	--

Notes:
1. PCB Aroclors by EPA Method 8082
2. μg/L (ppb) = micrograms per liter (part per billion)
3. Ecological Receptor Screening Level Values = Oak Ridge National Laboratory's Tier II SCV presented where available
4. Portland Harbor specific fish consumption rate screening levels presented where available
5. Total PCBs is a summation of the detected aroclors.
6. i = The MRL (method reporting limit) / MDL (method detection limit) has been elevated due to a matrix interference
7. -- = Not available.

Table A-10
Storm Water Analytical Results: Polynuclear Aromatic Hydrocarbons
Swan Island Upland Facility - OU4
Portland, Oregon

Monitoring Location	Date Sampled	Naphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Dibenzofuran	Fluorene	Phenanthrene	Anthracene	Fluoranthene
		Concentrations in µg/L (ppb)								
WR-399	6/3/2008	0.013 J	0.0076 J	0.0043 J	<0.020	<0.020	0.0045 J	0.014 BJ	0.0063 J	0.016 J
Ecological Receptor Screening Level Values		620 (3)	2.1 (4)	--	520 (3)	3.7 (4)	3.9 (4)	--	0.73 (4)	--
Portland Harbor specific fish consumption rate		--	--	--	99	--	530	--	4,000	14

Monitoring Location	Date Sampled	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
		Concentrations in µg/L (ppb)								
WR-399	6/3/2008	0.026	<0.020 i	0.0077 J	0.0099 J	0.0029 J	0.0060 J	0.014 J	0.0071 J	0.021
Ecological Receptor Screening Level Values		--	0.027 (4)	--	--	--	0.014 (4)	--	--	--
Portland Harbor specific fish consumption rate		400	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	--

Notes:

1. Polynuclear Aromatic Hydrocarbons by EPA Method 8270 C SIM
2. µg/L (ppb) = micrograms per liter (part per billion)
3. DEQ 2004 AWQC (chronic).
4. Oak Ridge National Laboratory's Tier II SCV.
5. J = The results is an estimated concentration that is less than the MRL but greater than or equal to the MRL/MDL (method detection limit
6. < = Not detected above the method reporting limit (MRL)
7. Shading indicates that the reported concentration or MRL exceeds Ecological Receptor SLV and/or fish consumption rate
8. -- = Not available.

Attachment B

Cascade General Site Investigation Data Tables

Table B-1. URS Soil Analytical Results

Shipyard Commerce Center Parking Lot Purchase (units = mg/kg)

	Location	Sample ID	Sample Depth (ft)	Date	NWTPH-Dx[1] Diesel Range	NWTPH-Dx[1] Heavy Oil Range	NWTPH-Gx Gasoline Range	SVOCs	PCBs	TBT Compounds: Tributyltin	TBT Compounds: Dibutyltin	TBT Compounds: Butyltin	Detected PAHs per EPA 8270-SIM: Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Detected Priority Pollutant Metals: Arsenic	Barium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
URS Soil Results	GP-01	GP01-05-080523	4-8	23-May-08	21.8U	43.7U	3.78U	< MRLs except PAHs[5]	< MRLs	0.0036U	**0.023**	**0.0075**	0.0521U	**0.135**	**0.237**	**0.332**[2]		**0.303**	**0.202**	**0.385**	**0.243**	0.0521U	**0.0779**	**0.536**	**2.19**	-	**9.52**	**10.6**	**2.27**	0.0857U	**11.6**	**30**
		GP01-20-080523	18-22	23-May-08	42.4U	84.9U	6.09U			0.0037U	0.0055U	0.0039U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	0.0495U	**3.61**	-	**19**	**20.3**	**3.81**	**0.563**	**22.3**	**55.6**
		GP01-40-080523	36-40	23-May-08	29.2U	58.5U	4.82U			0.0037U	0.0055U	0.0039U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	0.0428U	**2.65**	-	**12.7**	**14**	**2.23**	0.113U	**15.4**	**37.7**
	GP-02	GP02-5-080517	4-6	17-May-08	23.4U	46.9U	3.98U			0.0038U	0.0057U	0.0040U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	0.0349U	**1.71**	-	**12.7**	**11.5**	**1.94**	0.0963U	**15**	**38.5**
		GP02-50-080517	50-52	17-May-08	38U	75.9U	5.08U			0.0037U	0.0055U	0.0039U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	0.0488U	**1.76**	-	**18.9**	**16.8**	**2.82**	0.121U	**21**	**50.1**
		GP02-75-080517	73-75	17-May-08	28.3U	56.7U	4.83U			0.0038U	0.0057U	0.0040U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	0.0431U	**3.17**	-	**11.9**	**13.4**	**2.23**	0.114U	**17.8**	**40.6**
		GP02-110-080517	108-110	17-May-08	35.1U	70.2U	4.86U			0.0038U	**0.032**	**0.010**	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	0.0458U	**2.08**	-	**12.7**	**14.4**	**2.12**	0.112U	**18.8**	**41**
	GP-03	GP03-05-080523	4-8	23-May-08	35.8U	71.6U	4.94U			0.0036U	0.0054U	0.0038U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	0.0466U	**1.79**	-	**10.1**	**11.3**	**1.97**	0.11U	**13.1**	**36.8**
		GP03-20-080523	18-22	23-May-08	38.9U	77.8U	5.29U			0.0037U	**0.024**	**0.0062**	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	0.0439U	**2.82**	-	**19.5**	**18.1**	**3.35**	0.109U	**20.8**	**49.1**
		GP03-40-080523	36-40	23-May-08	35.2U	70.3U	4.93U			0.0038U	0.0057U	0.0040U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	0.0379U	**3.24**	-	**11.8**	**13.8**	**1.99**	0.122U	**15.2**	**37.5**
	GP-04	GP04-05-080522	4-8	22-May-08	32.8U	65.6U	4.63U			0.0038U	0.0058U	0.0041U	0.0724U	**0.144**	**0.283**	**0.37**[2]		**0.255**	**0.231**	**0.471**	**0.227**	0.0724U	**0.246**	**0.684**	**3.94**	-	**14**	**14.3**	**2.48**	0.096U	**16.8**	**41.4**
		GP04-20-080522	18-22	22-May-08	30U	59.9U	4.61U			0.0038U	**0.0072**	0.0040U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	0.0315U	**2.79**	-	**17.7**	**15.2**	**3.26**	0.106U	**18.9**	**43.8**
		GP04-40-080522	36-40	22-May-08	37.4U	74.8U	4.86U			0.0038U	**0.0086**	0.0040U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	0.0387U	**1.82**	-	**17.9**	**15.4**	**2.7**	0.115U	**15.7**	**41.9**
	GP-05	GP05-05-080522	4-8	22-May-08	34U	67.9U	4.93U			0.0038U	0.0057U	0.0040U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	0.0443U	**2.04**	-	**12.7**	**13.3**	**2.2**	0.111U	**16**	**39**
		GP05-20-080522	18-22	22-May-08	48.9U	97.8U	6.32U			0.0037U	**0.038**	**0.0082**	**0.0448**	**0.0873**	**0.0803**	**0.0956**[2]		0.0434U	**0.0984**	**0.187**	0.0434U	0.0434U	**0.139**	**0.235**	**2.89**	-	**15.1**	**16.6**	**3.03**	0.141U	**20.9**	**49**
		GP05-40-080522	36-40	22-May-08	32.8U	65.6U	4.19U			0.0037U	**0.0088**	0.0039U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	0.0346U	**1.59**	-	**10.1**	**12.1**	**1.72**	0.0883U	**12.6**	**32.4**
	GP-06	GP06-7.5-080516	5-10	16-May-08	**190**	**536**	4.72U			0.0037U	**0.028**	**0.0080**	0.938U	**2.94**	**5.88**	**7.38**[2]		**5.61**	**5.04**	**9.1**	**4.73**	0.938U	**3.56**	**13**	**2.09**	-	**12.7**	**13.4**	**2.82**	0.0955U	**16**	**41.4**
		GP06-50-080516	47-53	16-May-08	29.8U	59.6U	4.97U			0.0038U	0.0057U	0.0040U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	1.29U	-	**14.7**	**14.4**	**2.4**	0.103U	**18.4**	**46**
		GP06-75-080516	70-75	16-May-08	34.9U	69.8U	4.73U			0.0038U	0.0057U	0.0040U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	**1.58**	-	**13.5**	**12.7**	**2.06**	0.107U	**18.9**	**39.4**
		GP06-110-080516	105-110	16-May-08	33.3U	66.6U	5.00U			0.0038U	0.0057U	0.0040U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	**2.15**	-	**12.2**	**14.4**	**2.16**	0.0988U	**17.5**	**41.7**
	GP-07	GP07-05-080522	4-8	22-May-08	34U	68U	4.60U			0.0036U	**0.0073**	**0.0045**	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	0.0363U	**3.04**	-	**18**	**17.5**	**3.13**	0.107U	**20.3**	**47.5**
		GP07-20-080522	18-22	22-May-08	33.9U	**115**	4.67U			0.0037U	0.0055U	0.0039U	0.338U	0.338U	0.338U	0.338U	0.338U	0.338U	0.338U	0.338U	0.338U	0.338U	0.338U	0.338U	**3.04**	-	**19.4**	**20.2**	**5.19**	**0.116**	**21.3**	**54.6**
		GP07-40-080522	36-40	22-May-08	35.9U	71.7U	4.80U			0.0037U	0.0055U	0.0039U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	0.0413U	**4.34**	-	**12.2**	**13.6**	**2.81**	0.109U	**14.7**	**34.3**
	GP-08	GP08-05-080522	4-8	22-May-08	28.6U	57.1U	4.77U			0.0038U	**0.019**	0.0040U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	0.0393U	**2.79**	-	**21.4**	**16.7**	**3.47**	0.117U	**21.2**	**48.5**
		GP08-20-080522	18-22	22-May-08	32.2U	64.5U	4.72U			0.0038U	**0.0094**	0.0040U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	**2.07**	-	**12.4**	**13.4**	**2.25**	0.105U	**14.9**	**39.3**
		GP08-40-080522	36-40	22-May-08	29.5U	59U	4.78U			0.0037U	0.0055U	0.0039U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	0.0362U	**1.74**	-	**12.5**	**14.9**	**2.07**	0.116U	**15.1**	**39.2**
	GP-09	GP09-5-080518	5-8	18-May-08	24.3U	**411**	4.23U			0.0039U	0.0058U	0.0041U	0.207U	-	1.03U	0.207U	0.207U	1.03U	0.207U	0.207U	1.03U	0.207U	0.207U	0.207U	**2.38**	-	**14.1**	**12.8**	**2.56**	**0.117**	**15.1**	**43.5**
		GP09-50-080518	48-50	18-May-08	30.2U	60.4U	5.02U			0.0037U	0.0055U	0.0039U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	0.0441U	1.43U	-	**11.2**	**13.6**	**1.92**	0.115U	**15**	**39.3**
		GP09-75-080518	73-75	18-May-08	31.3U	62.6U	4.77U			0.0038U	**0.018**	**0.0047**	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	0.0434U	**1.41**	-	**10.4**	**12.3**	**1.89**	0.103U	**14**	**36.1**
		GP09-110-080518	108-110	18-May-08	27.6U	55.3U	4.99U			0.0038U	0.0057U	0.0040U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	0.0325U	**2.23**	-	**15.3**	**15.4**	**2.37**	0.104U	**24.5**	**46**
	GP-10	GP10-5-080518	3-5	18-May-08	38.2U	76.4U	5.60U			0.0036U	0.0054U	0.0038U	0.0508U	0.0508U	0.0508U	0.0508U	0.0508U	0.0508U	0.0508U	0.0509	0.0508U	0.0508U	0.0508U	**0.0624**	**2.97**	-	**30.6**	**25.5**	**5.63**	0.119U	**25.4**	**61.6**
		GP10-18-080518	17-19	18-May-08	36.4U	72.8U	5.30U			0.0036U	0.0054U	0.0038U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	0.0851U	**5.75**	-	**23.1**	**24**	**4.54**	**0.195**	**24.2**	**59.8**
		GP10-40-080518	38-40	18-May-08	30.7U	61.4U	5.41U			0.0036U	0.0054U	0.0038U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	**2.56**	-	**22.2**	**20.2**	**3.02**	0.0989U	**24.5**	**56.9**
	GP-11	GP11-5-080518	3-5	18-May-08	31U	62.1U	4.89U			0.0038U	0.0056U	0.0040U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	0.0455U	**3.47**	-	**31.6**	**26.8**	**5.01**	**0.409**	**26.3**	**61.6**
		GP11-20-080518	18-20	18-May-08	36.6U	73.3U	5.57U			0.0037U	0.0055U	0.0039U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	0.0461U	**0.0687**	0.0461U	**0.0498**	**0.0566**	**0.0777**	**4.37**	-	**35.1**	**51.7**	**28.1**	**1.83**	**27.1**	**88**
		GP11-40-080518	38-40	18-May-08	27.1U	54.2U	4.79U			0.0036U	0.0054U	0.0038U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	0.0365U	**2.07**	-	**23.5**	**20.5**	**2.96**	0.0959U	**21**	**50.8**
DEQ Default Background Concentrations for Metals[3]					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	42	**36**	**17**	**0.07**	38	**86**
DEQ Soil RBCs[4]	Soil Ingestion, Dermal Contact, and Inhalation (below 3 feet bgs)		Occupational		70,000	-	22,000	-	0.98	-	-	-	>1.0E+05	2.7	0.27	2.7	27	-	270	29,000	2.7	770	-	21,000	1.7	-	>1.0E+05[6]	38,000	800	310	20,000	-
			Construction Worker		23,000	-	13,000	-	4.4	-	-	-	90,000	21	2.1	21	210	-	2100	8,900	21	710	-	6,700	13	62,000	>1.0E+05[6]	11,000	800	93	6,200	-
			Excavation Worker		-	-	-	-	120	-	-	-	>1.0E+05	590	59	590	5,900	-	59,000	-	590	20,000	-	-	370	-	>1.0E+05[6]	-	800	2,600	-	-
	Volatilization to Outdoor Air		Occupational		-	-	80,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vapor Intrusion into Buildings		Occupational		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

mg/kg: milligrams per kilogram
VOCs : volatile organic compounds per EPA 8260B
SVOCs : semi volatile organic compounds per EPA 8270C
PCBs: polychlorinated biphenyls by EPA 8082
Bold font = indicates detected concentrations above the MRL

TBT: Tributyl Tins by EPA 8270D-Selected Ion Monitoring (SIM)
PAHs: polyaromatic hydrocarbons per EPA 8270-Selected Ion Monitoring (SIM)
Total Metals per EPA 6020
MRL: method reporting limit

U: less than the MRL
- : Data not analyzed or not applicable

Boxed values indicates an exceedance of the default background concentration (where applicable) and a screening level value (SLV).

1: TPH-Dx = Diesel and oil-range total petroleum hydrocarbons (TPH) by Northwest Method NWTPH-Dx.

2: Peak separation for Benzo(b) and Benzo(k)fluoranthenes does not meet method specified criteria. Reported result includes the combined area of the two isomers and should be considered the total of Benzo(b+k)Fluoranthene

3 DEQ, 2002. Memo from Toxicology Workgroup. Default Background Concentration for Metals. October 28.

4: DEQ, 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. September 29.

4: DEQ, 2007. RBCs for Individual Chemicals. Revised RBC Spreadsheet. July 4.

5: SVOCs were below the MRLs except for some PAH compounds detected in samples: GP06-7.5-080516 & GP07-40-080522. Only PAH detections from the 8270-SIM analysis are reported above.

6: Chromium (III)

Table B-2. URS Grab Groundwater Analytical Results

Shipyard Commerce Center Parking Lot Purchase (units = ug/L)

	Location	Sample ID	Sample Depth (ft)	Date	NWTPH-Dx Diesel Range	NWTPH-Dx Heavy Oil Range	NWTPH-Gx Gasoline Range	VOCs	SVOCs	PCBs	TBT Compounds	Detected PAHs: Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Detected Priority Pollutant Total Metals: Arsenic	Beryllium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
URS Groundwater Results	GP-01	GP01-GW40-080523	36-40	23-May-08	234U	467U	80.0U	< MRLs				**0.051**	**0.0646**	**0.100** [1]		**0.0625**	**0.0604**	**0.142**	**0.0545**	0.0381U	**0.0728**	**0.183**	**3.74**	1U	**26.4**	**26.2**	**3.73**	0.1U	**62.7**	**48.7**
	GP-03	GP03-GW40-080523	36-40	23-May-08	238U	476U	80.0U					0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	**9.6**	**1.09**	**77.7**	**54.8**	**8.76**	0.1U	**59.2**	**119**
	GP-04	GP04-GW40-080522	36-40	22-May-08	240U	481U	80.0U					**0.105**	**0.141**	**0.204** [1]		**0.153**	**0.154**	**0.422**	**0.128**	0.037U	**0.304**	**0.522**	**8.97**	**1.66**	**101**	**75.9**	**12.5**	0.1U	**87.1**	**165**
	GP-05	GP05-GW40-080522	36-40	22-May-08	238U	476U	80.0U					**0.0778**	**0.104**	**0.150** [1]		**0.11**	**0.111**	**0.298**	**0.0919**	0.0381U	**0.202**	**0.367**	**30.7**	**1.5**	**52.9**	**50**	**9.79**	0.1U	**53.1**	**110**
	GP-07	GP07-GW40-080522	36-40	22-May-08	253U	505U	80.0U					0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	0.0408U	**6.38**	1U	**33.6**	**27.4**	**5.01**	0.1U	**36**	**67.2**
	GP-08	GP08-GW40-080522	36-40	22-May-08	234U	467U	80.0U					0.0374U	0.0374U	0.0374U	0.0374U	0.0374U	0.0374U	0.0374U	0.0374U	0.0374U	0.0374U	0.0374U	**26.1**	**1.3**	**55**	**52.3**	**9.96**	0.1U	**56.6**	**118**
	GP-10	GP10-GW40-080518	36-40	18-May-08	236U	472U	80.0U					0.0392U	0.0392U	0.0392U	0.0392U	0.0392U	0.0392U	0.0392U	0.0392U	0.0392U	0.0392U	0.0392U	**9.26**	**1.43**	**73.4**	**67.6**	**12.4**	0.1U	**79**	**249**
	GP-11	GP11-GW40-080518	36-40	18-May-08	236U	472U	80.0U					0.0376U	0.0376U	0.0376U	0.0376U	0.0376U	0.0376U	0.0376U	0.0376U	0.0376U	0.0376U	0.0376U	**13.6**	**1.07**	**53.5**	**45.5**	**8.24**	**0.112**	**51.3**	**108**
	GP-02	GP02-GW110-080517	106-110	17-May-08	236U	472U	80.0U					0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	0.0381U	**0.0929**	0.0381U	0.0381U	**20.4**	1U	**37**	**40.4**	**7.42**	0.1U	**38.6**	**157**
	GP-06	GP06-GW110-080516	106-110	16-May-08	238U	476U	80.0U					0.0381U	**0.0381**	0.0762U [1]		**0.0392**	0.0381U	**0.074**	0.0381U	0.0381U	**0.0494**	**0.0954**	**33.8**	**2.59**	**221**	**303**	**22.3**	**0.212**	**167**	**3730**
	GP-09	GP09-GW110-080518	106-110	18-May-08	236U	472U	80.0U					0.0375U	0.0375U	0.0375U	0.0375U	0.0375U	0.0375U	0.0375U	0.0375U	0.0375U	0.0375U	0.0375U	**19.1**	1U	**45.2**	**43.2**	**5.13**	0.1U	**33.6**	**201**
Human Health Screening Level Values																														
DEQ Groundwater RBCs [2]	Ingestion & Inhalation from Tapwater		Occupational		350	-	400	-	-	0.20	-	0.56	0.056	0.56	5.6	-	56	5,800	0.56	25	-	4,400	0.27	290	220,000 [3]	5,400	15	44	2,900	-
	Volatilization to Outdoor Air		Occupational		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vapor Intrusion into Buildings		Occupational		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GW in Excavation		Construction & Exca.		9,700	-	12,000	-	-	1.9	-	9.1	0.53	5.2	49	-	910	9,600	2.9	680	-	5,800	5.8	250	190,000 [3]	4,600	-	37	12,000	-
JSCS Table 3-1: Groundwater / Surface Water (Human Health SLVs) [4]					-	-	-	-	-	6.40E-05	11	0.0018	0.0018	0.0018	0.0018	0.2	0.0018	0.2	0.0018	0.2	0.2	0.2	0.045	-	100	1,300	15	0.0146	460	2,600
Ecological Screening Level Values																														
JSCS Table 3-1: Groundwater / Surface Water / Stormwater (Ecological SLVs) [4]					-	-	-	-	-	0.014	0.072	0.027	0.014	-	-	-	-	-	-	12.0	-	-	3.1	-	-	2.7	0.54	0.012	16	33

Notes:

ug/L: micrograms per liter

VOCs : volatile organic compounds per EPA 8260B

SVOCs : semi volatile organic compounds per EPA 8270C

PCBs: polychlorinated biphenyls by EPA 8082

TBT: Tributyl Tins by EPA 8270D-Selected Ion Monitoring (SIM)

PAHs: polyaromatic hydrocarbons per EPA 8270-SIM

Total Metals per EPA 6020

MRL: method reporting limit

MRLs listed in data report in Appendix A

U: less than the MRL

- : Data not analyzed or not applicable

Bold font = indicates detected concentrations above the MRL

Boxed values indicates an exceedance of a screening level value (SLV)

1: Peak separation for Benzo(b) and Benzo(k)fluoranthenes does not meet method specified criteria. Reported result includes the combined area of the two isomers and should be considered the total of Benzo(b+k)Fluoranthene

2: DEQ, 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. September 29.

2: DEQ, 2007. RBCs for Individual Chemicals. Revised RBC Spreadsheet. July 4. http://www.deq.state.or.us/lq/rbdm.htm

3: Chromium (III)

4: DEQ, 2007. Portland Harbor Joint Source Control Strategy (JSCS) Document. Table 3-1 (7/16/07 Revison). Most Conservative Screening Level Values (SLVs) for Groundwater / Surface Water / Stormwater Values divided into human health and ecological.

N CHANNEL AVE

N DOLPHIN ST

EMPLOYEE PARKING

GP-01

GP-02

GP-03

GP-04

GP-05

GP-06

GP-07

GP-08

GP-09

GP-10

GP-11

B-1

B-7

PAVED PARKING LOT

LOW CHAIN FENCE

GRAVEL ACCESS ROAD

SITE BOUNDARY

WILLAMETTE RIVER

50 0 50 100

SCALE IN FEET

SUBJECT PROPERTY BOUNDARY

FENCING

GP-03 URS BORING LOCATION

B-7 APPROXIMATE LOCATION OF HISTORICAL BORING

URS

BORING LOCATIONS

SHIPYARD COMMERCE CENTER

JUNE 2008 PHASE II ESA

25696667 PORTLAND, OREGON

FIGURE 3

G:\25696712 Shipyard CC LLC Phase II ESA\4000 Deliverables\CAD\Fig 3 Boring Locations.dwg Jun 17, 2008 - 4:57pm

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP01

Sheet 1 of 1

Date(s) Drilled	**5/23/2008**	Logged By	**Zack Oremland**	Checked By	**Nicky Moody**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**18 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**SILTY CLAY [ML-CL]**, grey brown, dry, low plasicity, layered.	
								GP-01-05-080523
							SILT [ML], grey, wet	Sample Depth = 4'-8'
			2				**POORLY GRADED SAND [SP]**, brown, moist, medium grained.	Sample Time = 0842
	10							
							SILT [ML], silt layer	
			3				**LEAN CLAY [CL]**, dark grey	
							POORLY GRADED SAND [SP], dark grey, medium grained, moist.	
							Changes to brown, wet	
			4				*Changes to dark grey* ▽	GP-01-20-080523
	20							Sample Depth =18'-22'
								Sample Time = 0901
			5				**SILT [ML]**, with organics, wet	
							LEAN CLAY [CL], olive grey, wet	
			6					
	30						**SILT [ML]**, olive green, wet	
							SILTY SAND [SM], wet, fined grained	
			7				**LEAN CLAY [CL]**, brown, wet	
							POORLY GRADED SAND [SP], brown to black, medium grained, wet	
			8					GP-01-40-080523
	40							Sample Depth = 36'-40'
								Sample Time = 0931
							Terminated at 40-feet bgs and backfilled with bentonite chips on 5/23/2008.	
	50							

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP01

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP02

Sheet 1 of 2

Date(s) Drilled	**5/17/2008**	Logged By	**Nicky Moody**	Checked By	**Brian Pletcher**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**110.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**18 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Grout**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, %	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6" Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1	95			**SILT [ML]**, olive grey, moist, non plastic, no odor, no sheen.	
					0		**POORLY GRADED SAND [SP]**, dark brown to brownish yellow, moist to dry, loose to medium dense, medium to coarse sand, no odor, no sheen.	GP02-05-080517 Sample Depth = 4'-5' Sample Time = 0800
			2	90			*Grades to medium grained sand.*	
	10				0			
			3	80			*Fine gravel encountered.*	
					0		*Grades to trace fine gravel.*	
			4	100			*1-inch seam of dark olive to gray clay, medium stiff* ▽	
	20				0			
			5	95			**LEAN CLAY [CL]**, dark grey, medium plasticity, wet, medium stiff, with some silt, no odor, no sheen.	
					0		**POORLY GRADED SAND [SP]**, dark gray, wet, medium grained, no odor, no sheen.	
			6	95			**LEAN CLAY [CL]**, dark grey, wet, medium stiff, medium plasticity, no odor, no sheen.	
	30				0			
			7	95			**SILT [ML]**, olive gray, moist.	
					0		**POORLY GRADED SAND [SP]**, dark gray, wet, medium grained, no odor, no sheen.	
			8	95				
	40				0		*Grades to black.*	
			9	90				
					0		*Grades to medium ot coarse grained.*	
			10	95				
	50				0			GP02-50-080517 Sample Depth = 50'-52' Sample Time = 0950
			11	95			*Grades medium grained.*	

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP02

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP02

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, %	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
					0		**POORLY GRADED SAND [SP]**, dark gray, wet, medium grained, no odor, no sheen.	
			12	95				
	60							Sampler jammed, 60-65 feet.
			13	0				
					0			
			14	50				
	70				0			
			15	86				
					0			GP02-75-080517 Sample Depth = 73'-75' Sample Time = 1055
			16	90				
	80				0			80 to 105 feet, no samples collected.
	90							
	100						*Same as Above*	
			17	80	0			GP02-110-080517 Sample Depth = 108'-110' Sample Time = 1220
	110						Boring terminated at 110 feet bgs and backfilled with cement bentonite grout upon completion on 5/17/2008.	

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP02

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP03

Sheet 1 of 3

Date(s) Drilled	**5/23/2008**	Logged By	**Zack Oremland**	Checked By	**Nicky Moody**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**18 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**SILTY CLAY [CL-ML]**, grey, dry, soft, interbedded silt and clay.	
							POORLY GRADED SAND [SP], dark brown to dark grey, dry, coarse grained.	GP03-05-080523 Sample Depth = 4'-8' Sample Time = 1032
			2					
	10							
			3					
			4				▽	
	20						*Soil becomes wet at 19-feet*	GP03-20-080523 Sample Depth = 18'-22' Sample Time =1040
			5				**SILTY CLAY [ML]**, grey to olive, dry, soft, interbedded silt and clay. *Less silt*	
			6				**LEAN CLAY [CL]**, brown, high plasticity, wet *At 28 feet thin layer of highly plastic silt noted*	
	30						*Less plastic, higher silt content noted*	
			7				**POORLY GRADED SAND [SP]**, dark brown to brown black, dry, coarse grained. *Color change to dark brown, medium grained, wet* *Color change to black*	
			8					GP03-40-080523 Sample Depth = 36'-40" Sample Time = 1058
	40						**Geoprobe driven to 157 feet, no samples taken**	
	50							

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP03

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP03

Elevation, feet / Depth, feet	SAMPLES: Type / Number	SAMPLES: Recovery, %	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
60						
70						
80						
90						
100						
110						

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP03

Elevation, feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	Recovery, %	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	120							
	130							
	140							
	150							
							Boring Terminated at 157-feet bgs and backfilled with cement bentonite grout on 5/23/2008.	
	160							
	170							
	180							

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP04

Sheet 1 of 1

Date(s) Drilled	**5/22/2008**	Logged By	**Zack Oremland**	Checked By	**Nicky Moody**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**21feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**POORLY GRADED SAND [SP]**, brown, wet	
							POORLY GRADED GRAVEL [GP]	
							LEAN CLAY [CL], olive grey	GP04-05-080522 Sample Depth = 4'-8' Sample Time = 1211
			2				**POORLY GRADED SAND [SP]**, brown, medium grained	
	10						**SILTY CLAY [CL-ML]**, brown	
			3				**POORLY GRADED SAND [SP]**, brown, coarse sands	
							SILTY SAND [SM], brown grey	
							SILTY CLAY [CL], dark grey, WET	
							POORLY GRADED SAND [SP], dark grey, medium grained wet	
			4					GP04-20-080522 Sample Depth = 18'-22' Sample Time = 1222
	20						**LEAN CLAY [CL]**, olive grey, soft, wet	
			5					
							SILT [ML], olive grey, soft, wet	
			6					
	30						**SILTY SAND [SM]**, brown, wet, fine grained	
			7				**LEAN CLAY [CL]**, brown, wet	
							POORLY GRADED SAND [SP], brown, wet, medium grained	
			8				*Lense of clayey silt, grey, wet*	GP04-40-080522 Sample Depth = 36'-40' Sample Time = 1253
							Changes to black sand	
	40						Terminated at 40-feet bgs and backfilled with cement bentonite chips on 5/22/2008	
	50							

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP04

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP05

Sheet 1 of 1

Date(s) Drilled	**5/22/2008**	Logged By	**Zack Oremland**	Checked By	**Nicky Moody**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**16 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**SILTY CLAY [CL-ML]**, grey brown, dry, soft, with medium sand.	
							POORLY GRADED SAND [SP], brown, dense, dry, medium grained	GP05-05-080522 Sample Depth = 4'-8' Sample Time = 1406
			2				*Pebbles encountered*	
	10							
			3					
							▽	
							Grades to wet	
			4					GP05-20-080522 Sample Depth = 18'-22' Sample Time = 1414
	20						*Color change to dark grey at 19-feet*	
			5				**LEAN CLAY [CL]**, dark grey to, medium plasticity, wet	
			6					
	30						*Grades to hard white clay*	
			7				**POORLY GRADED SAND [SP]**, dark grey to black, wet, medium grained	
			8					GP05-40-080522 Sample Depth = 36'-40' Sample Time = 1437
	40						Boring terminated at 40-feet bgs and backfilled with bentonite chips on 5/22/2008.	
	50							

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP05

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP06

Sheet 1 of 2

Date(s) Drilled	**5/22/2008**	Logged By	**Zack Oremland**	Checked By	**Nicky Moody**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**110.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**16 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Grout**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**SILTY CLAY [CL-ML]**, grey brown, dry, no odor, no sheen.	
							POORLY GRADED SAND [SP], Dark brown to black, moist to dry, loose to medium dense, medium grained.	GP06-05-080522 Sample Depth = 5'-10' Sample Time = 0810
			2					
	10						*A thin layer of fine gravels noted*	
			3				▽	
			4				**LEAN CLAY [CL]**, dark grey, wet, with some silt, no odor, no sheen.	
							POORLY GRADED SAND [SP], dark grey, moist, loose to dense, some silt.	
	20						*Grades to brown, wet, no silt*	
			5				**LEAN CLAY [CL]**, grey, very soft, wet, with some silt, no odor, no sheen.	
							Wood chips encountered	
			6					
	30						**POORLY GRADED SAND [SP]**, brown, wet, medium grained, some silt.	
			7					
			8					
	40						*Changes to black*	
			9				*Wood debris encountered*	
			10					
	50						*Wood debris encountered*	GP06-50-080522 Sample Depth = 47'-53' Sample Time = 0915
			11					

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP06

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP06

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
			12				**POORLY GRADED SAND [SP]**, black, wet, medium grained, some silt.	
	60		13					
							Some fine gravels encountered, well rounded	
			14					
	70		15					
								GP06-75-080522 Sample Depth = 70'-75' Sample Time = 1050
			16					
	80		17					
			18					
	90		19					
			20					
	100		21					
							Wood debris encountered	
			22					GP06-110-080522 Sample Depth = 106'-110' Sample Time = 1420
	110						Boring terminated at 110-feet bgs and backfilled with cement bentonite grout on 5/22/2008.	

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP07

Sheet 1 of 1

Date(s) Drilled	**5/22/2008**	Logged By	**Zack Oremland**	Checked By	**Nicky Moody**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**18 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**SILTY CLAY [CL-ML]**, grey	
							POORLY GRADED SAND [SP], brown, medium grained	GP07-05-080522 Sample Depth = 4'-8' Sample Time = 1018
			2					
	10						**LEAN CLAY [CL]**, grey, wet	
			3				**POORLY GRADED SAND [SP]**, brown, medium grained	
							SILT [ML], grey, moist	
			4				▽	
							SILTY CLAY [CL-ML], grey, highly plastic, wet.	GP07-20-080522 Sample Depth = 18'-22' Sample Time = 1029
	20		5					
			6					
	30						**POORLY GRADED SAND [SP]**, brown, wet, some silt, fine to medium grained	
			7					
			8					GP07-40-080522 Sample Depth = 36'-40' Sample Time = 1054
							Grades to dark brown medium grained	
	40						Boring terminated at 40-feet bgs and backfilled with bentonite chips on 5/22/2008	
	50							

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP08

Sheet 1 of 1

Date(s) Drilled	**5/15/2008**	Logged By	**Zack Oremland**	Checked By	**Nicky Moody**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not Measured**
Groundwater Level and Date Measured	**18 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**SILTY CLAY [CL-ML]**, grey, low plasticity, dry, interbedded with brown sand, no odor, no sheen.	
							POORLY GRADED SAND [SP], brown, dry, medium grained.	GP08-05-080522 Sample Depth = 4'-8' Sample Time = 0832
			2				*Thin silt layer encountered*	
	10						*Grades to moist*	
			3				**LEAN CLAY [CL]**, brown, moist, with rounded to well rounded fine gravels.	
							wet ▽	
			4				**POORLY GRADED SAND [SP]**, grey to black, wet, loose to dense, medium grained.	GP08-20-080522 Sample Depth = 18'-20' Sample Time = 0850
	20						**LEAN CLAY [CL]**, olive grey, highly plastic, wet, no odor, no sheen.	
			5					
			6					
	30							
			7				**POORLY GRADED SAND [SP]**, dark brown, wet, medium grained, with coarse interbedded silt.	
			8					GP08-40-080522 Sample Depth = 36'-40' Sample Time = 0920
	40						Boring terminated at 40-feet bgs and backfilled with bentonite chips on 5/15/2008.	
	50							

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP08

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP09

Sheet 1 of 2

Date(s) Drilled	**5/18/2008**	Logged By	**Nicky Moody**	Checked By	**Brian Pletcher**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**110.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not**
Groundwater Level and Date Measured	**19 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Grout**	Location			

Elevation, feet / Depth, feet	SAMPLES Type	Number	Recovery, %	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
		1	0			**POORLY GRADED SAND [SP]**, brown yellow, dry, medium grained, loose, no odor, no sheen.	
				0			GP09-05-080518 Sample Depth = 5'-8' Sample Time = 0800
		2	20				
10				0			
		3	95	0			
		4	95			▽	
20				0		**LEAN CLAY[CL]**, loive grey, medium plasticity, no odor, no sheen.	
						CLAYEY SAND (SC), olive grey, wet, fine grained, no odor, no sheen.	
		5	80			**SILTY SAND [SM]**, brown, wet, loose to dense.	
				0		**POORLY GRADED SAND [SP]**, brown, wet, fined to medium grained, with clay, loose to dense.	
		6	100				
30				0		**LEAN CLAY [CL]**, grey, non plastic, wet, no odor, no sheen.	
						CLAYEY SAND [SC], dark brown, wet, no odor, no sheen.	
		7	100			**POORLY GRADED SAND [SP]**, dark brown, wet, medium grained, loose to dense.	
				0			
		8	100				
40				0			
		9	0				
				0			
		10	80				
				0			
50							GP09-50-080518 Sample Depth = 48'-50' Sample Time = 0845
		11	0	0			

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP09

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP09

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	60						**POORLY GRADED SAND [SP]**, black, wet, medium grained, loose to dense.	No samples collected for 50 to 70 feet
	70				0			GP09-75-080518 Sample Depth = 73'-75' Sample Time = 0915
	80							
	90							
	100		12	75	0			GP09-110-080518 Sample Depth = 108'-110' Sample Time = 1040
	110						Boring terminated at 110-feet bgs and backfilled with cement bentonite grout on 5/18/2008.	

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP09

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP10

Sheet 1 of 1

Date(s) Drilled	**5/18/2008**	Logged By	**Nicky Moody**	Checked By	**Brian Pletcher**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not**
Groundwater Level and Date Measured	**19 feet bgs**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**POORLY GRADED SAND [SP]**, dark brown to brownish yellow, dry to moist, medium grained.	
							SILTY [ML], olive grey, non plastic, moist, no odor, no sheen.	GP10-05-080518 Sample Depth = 3'-5' Sample Time = 1335
			2				**POORLY GRADED SAND [SP]**, dark brown to brownish yellow, dry to moist, medium grained.	
	10							
			3				*Grades to dark grey*	
			4					GP10-20-080518 Sample Depth = 17'-19' Sample Time = 1345
	20						▽	
			5				**LEAN CLAY [CL]**, olive grey to dark grey, moist to wet, medium plastic, dry, no odor, no sheen.	
							POORLY GRADED SAND [SC], dark grey, wet, with silt and clay, no ordor or sheen, sand with clay	
			6				**SILTY CLAY [CL-ML]**, olive grey to dark grey, moist to wet, medium plastic, dry, no odor, no sheen.	
	30						**POORLY GRADED SAND [SP-SC]**, dark grey, wet, with clay, no ordor or sheen	
			7				**POORLY GRADED SAND [SP]**, dark brown, medium sand, wet	
			8					GP10-40-080518 Sample Depth = 38'-40' Sample Time = 1405
	40						Boring terminated at 40-feet bgs and backfilled with cement bentonite chips.	
	50							

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP10

URS

Project: Shipyard Commerce Center Phase II
Project Location: Swan Island, Portland, Oregon
Project Number: 25696712

Log of Boring GP11

Sheet 1 of 1

Date(s) Drilled	**5/18/2008**	Logged By	**Nicky Moody**	Checked By	**Brian Pletcher**
Drilling Method	**Direct Push**	Drill Bit Size/Type		Total Depth of Borehole	**40.0 feet**
Drill Rig Type	**9500 VTR Power Probe**	Drilling Contractor	**Pacific Soil and Water, LLC**	Approximate Surface Elevation	**Not**
Groundwater Level and Date Measured	**Not encountered**	Sampling Method(s)	**2x5 Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Bentonite Chips**	Location			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery, %	SAMPLES Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						6"Asphalt over 6" gravel sub-base with medium to coarse sand.	
			1				**SILT [ML]**, grey, non plastic, stiff, no odor, no sheen.	
							POORLY GRADED SAND [SP], dark brown to brownish yellow, medium grained, dry to moist.	GP11-05-080522 Sample Depth = 3'-5" Sample Time = 1525
			2				**SILTY SAND [ML]**, brown, wet, loose to dense.	
	10						**POORLY GRADED SAND [SP]**, dark brown to brownish yellow, medium grained, dry to moist.	
			3					
			4				*as above but color change to dark grey, medium sand, wet*	GP11-20-080522 Sample Depth = 18'-20' Sample Time = 1535
	20						**LEAN CLAY [CL]**, dark grey, low plastic, wet, no odor, no sheen.	
							CLAYEY SAND [SC], olive grey, wet, no ordor no sheen	
			5				**LEAN CLAY [CL]**, dark grey, medium plastic, soft, wet, no odor, no sheen.	
			6				*Soil grades to denser clay*	
	30						**POORLY GRADED SAND [SC]**, dark brown, with clay, wet, no ordor, no sheen.	
			7				**POORLY GRADED SAND [SP]**, dark brown to brownish yellow, medium grained, dry to moist, no odor, no sheen.	
			8					GP11-40-080522 Sample Depth = 38'-40' Sample Time = 1555
	40						*Color grades to grey*	
							Boring terminated at 40-feet bgs and backfilled with bentonite chips on 5/18/2008.	
	50							

Report: PORT_ENV_PID; File: SHIPYARD PHASE II.GPJ; 6/18/2008 GP11

URS

Attachment C

Laboratory Analytical Reports (CD-Rom)

Attachment D

DEQ Data Reporting and Screening Tables (CD-Rom)

Attachment E

Cascade DEQ June 27, 2008 Letter Amendment

Oregon
Theodore Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6945
TTY (503) 229-5471

June 27, 2008

T. Alan Sprott
Director of Environmental Services
Cascade General, Inc.
5555 North Channel Ave., Ste 400
Portland, Oregon 97203

SUBJECT: Amendment to Letter Agreement
Cascade General Ship Repair Yard
ECSI #271

Dear Mr. Sprott:

This letter serves as an amendment to the May 8, 2006 Letter Agreement (2006 Agreement) between the Department of Environmental Quality (DEQ) and Vigor Industrial, LLC regarding DEQ review and oversight of an expanded preliminary assessment addressing potential impacts to the Willamette River from stormwater discharge at the Portland Shipyard.

This amendment expands the area addressed by the 2006 Agreement to include an adjacent 7.83 acre parcel located southwest of North Channel Avenue on Swan Island, Portland, OR ("adjacent parcel"). The adjacent parcel is bounded to the northeast by N. Channel Avenue, to the northwest by the Swan Island Shipyard property covered by the original Letter Agreement, and to the southwest and southeast by Port of Portland property. Its location is shown on the attached figure. The scope and focus of the assessment on the adjacent parcel will be the same as that being conducted at the Portland Shipyard under the 2006 Agreement (i.e., the assessment will focus on potential contaminant transport to the Willamette River via stormwater as of the date the adjacent parcel is transferred to Vigor Industrial by the Port of Portland).

DEQ and Vigor agree that DEQ project costs associated with oversight of work on the adjacent parcel will be applied to the existing account established for Vigor Industrial for the Portland Shipyard site under the 2006 Agreement.

The intent of this amendment is to incorporate the adjacent parcel within the scope of the 2006 Agreement upon transfer of that parcel to Vigor Industrial by the Port of Portland and to clarify that payment of DEQ costs associated with the stormwater

assessment on the adjacent parcel will be made through the existing account. All other terms of the 2006 Agreement remain unchanged and by this amendment are equally applicable to the adjacent parcel.

DEQ appreciates Vigor Industrial's continued interest in the Voluntary Cleanup Program and looks forward to working with you.

Sincerely,

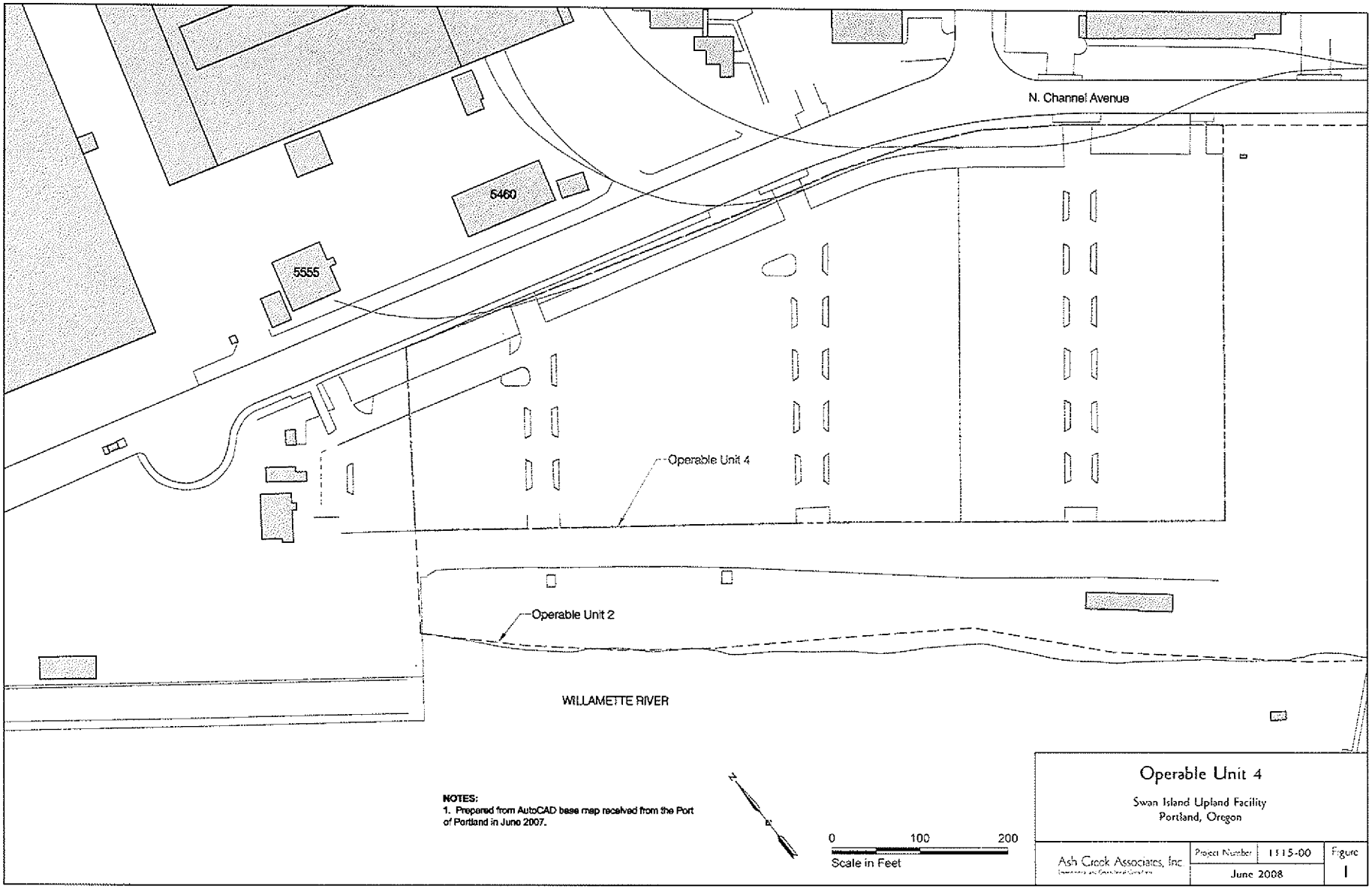
Keith Johnson, Manager
Lower Willamette Section
DEQ NWR

If the terms of this Amendment are acceptable to you, please have it executed by an authorized representative in the space provided below and returned to us.

Accepted and agreed to this 27 day of JUNE, 2008.

By _____

Title: VP



NOTES:
1. Prepared from AutoCAD base map received from the Port of Portland in June 2007.

Operable Unit 4

Swan Island Upland Facility
Portland, Oregon

Ash Creek Associates, Inc	Project Number 1115-00	Figure 1
	June 2008	